

REMARKS

The Office Action of July 24, 2008, has been carefully considered.

The Office action states that the Preliminary Amendment filed 6/1/2008 is non-compliant. Applicants did not file an Amendment on June 1, 2008, and have not filed a Preliminary Amendment in connection with this application. The papers entered into the application on June 1, 2008, appear to be documents forwarded by the International Bureau in connection with the PCT National phase application.

The Office action has pointed out that Applicant has not submitted an Information Disclosure Statement. An Information Disclosure Statement has now been filed, including a Form PTO-1449, a copy of the PCT Search Report and copies of non-U.S. patent references. A fee has also been paid in connection with filing the Information Disclosure Statement after the first Office action.

Claims 1-2 and 4-10 have been rejected under 35 USC 103(a) over Shaner et al in view of Vinden et al, and Claim 3 has been rejected under 35 USC 103(a) over Shaner et al in view of Vinden et al and Liu et al.

The invention is directed to a hardwood strand product including substantially aligned strands of one or more eucalypts bonded together with a binder including an isocyanate resin. The phenolic resin binder has been canceled from Claim 1, and from the specification at page 2, lines 1-3. Isocyanate binders are identified at page 3, lines 24-25 as the preferred binders.

Shaner et al has been cited to show an oriented strand board made of hardwood strands with a binder including a phenolic resin and wax, but fails to disclose that the hardwood is a eucalypt. Vinden et al has been cited for the teaching that eucalypts are hardwood species, and Liu et al

has been cited to show a hardwood strand board in which the binder is an isocyanate.

Shaner et al discloses only the use of phenolic resins, not isocyanate resins. At the time the present application was made, isocyanate resins were considered to be detrimental to the process of forming oriented strand boards, as they were known to bond with the presses almost as readily as the wood, thereby causing damage to equipment often resulting in significant down time and expense. Consequently, isocyanate resins were believed to be undesirable, particularly with strand board products requiring long press times to achieve curing of the resin at the core of the product.

Moreover, the phenolic resins of Shaner et al attach to the wood by "mechanical anchorage" (column 7, lines 28-29) only. The cell structure of cellulose hardwoods such as eucalypts, when compared with other hardwoods, make them unsuitable for bonding with phenolic resins. In contrast, isocyanate resins bond both mechanically and chemically with the wood; isocyanate resins do not rely on the porosity of the wood to the same degree as a phenolic resin which forms mechanical bonds by impregnating the pores. Instead, through considerable experimentation, it was found that the isocyanate resin reacted with the wood structure and composition, particularly for the eucalypts, chemically binding itself to the strands in a manner which phenolic resin is incapable.

Shaner et al discloses a wafer-type product formed from a series of laminates, and as a result of the process of its formation, the products have very low fastener holding capacity in planes parallel to the planes of the wafers. In contrast, the claimed invention provides for both chemical and mechanical bonding and has a higher fastener holding capacity in all planes.

Vinden et al discloses that a eucalypt is a "hardwood."

This term, however, simply defines a group of species of trees from which the wood originates, and Applicants submit that its use in Shaner et al is inappropriate under the particular circumstances. For example, balsa wood is classified as a hardwood, but could not be considered to be a candidate structural use, and eucalypts do not bond with phenolic resins in the manner, or with the strength, that the woods disclosed in Shaner et al do. Shaner et al is directed specifically to the use of North American oaks, and the fact that eucalypts is considered to be a hardwood would not automatically lead one skilled in the art to consider it appropriate for the method disclosed by Shaner et al.

The disclosure of Liu et al relates to the impregnation of woods with fire retardant compounds in order to make fire retardant composite materials. However, as will be shown, the introduction of the fire retardant compounds can actually weaken the product, and given the knowledge in the art, Applicants submit that there would be no motivation for one of ordinary skill in the art to utilize the Liu et al teachings.

Shaner et al quotes the U.S. Forestry Service laboratory specifications for structural boards, stating that the target modulus of elasticity is 800,000 psi. For the Liu et al product, the modulus of elasticity is much lower, its strength having been compromised by the introduction of fire retardant compounds.

To the extent that it would have been *prima facie* obvious to utilize eucalypts and isocyanate resins to form a hardwood strand product, Applicants believe that such obviousness can be rebutted by a showing of unexpected and non-trivial properties which are obtained in the products according to the invention. In order to present such evidence, Applicants submit herewith a Declaration under 37 CFR 1.132 from inventor Peter Edward Burton, the declaration being accompanied by an

exhibit which is a test report presenting data in support of the claimed invention.

Applicants point out that eucalypts had not been used in the manufacture of stranded products before the use thereof by Applicants. Applicants therefor requested that Siempelkamp, a world leading manufacturer of steam presses, undertake a significant amount of testing to determine whether eucalypts could be incorporated into hardwood strand products and the results of that testing are found in the report.

In particular, it is noted that a board disclosed by Liu et al had a modulus of elasticity in the range of 536,000 psi, whereas similarly dimensioned boards according to the invention, described on page 6 of the Exhibit, had a modulus of elasticity of 14,000 N/mm², corresponding to about 2,000,000 psi. On page 8 of the Exhibit, a board having a thickness of 44 mm and a density of 855 kg/m³ had a modulus of elasticity of 11,500 N/mm², corresponding to 1,641,247 psi.

The modulus of rupture of the product according to Liu et al averaged 4540 psi, while a corresponding product according to the invention, disclosed on page 2 of the Exhibit, had a modulus of rupture 82.10 N/mm², corresponding to 11,893 psi.

It is further noted that Shaner et al describes the reduction in cure time resulting from the use of a press and subsequent hot stacking. The cure time of Shaner et al is possible with use of hot stacking, but is between 6 and 8 minutes for a half-inch sample. In contrast, with an isocyanate resin and eucalypt strands, a half-inch mat in accordance with the claims does not require hot stacking and can cure in less than 2 minutes as disclosed at page 4 in the present specification.

Finally, modern structural products are subject to rigorous testing, one such test being the 24 hour moisture swell test. Products of the prior art have had high swell

factors when subject to this test, but eucalypts bonded with isocyanate resins as presently claimed had the unexpected result of an extremely low swell. In contrast to the prior art, moisture cannot penetrate further than the skin of the product due to the cell structure of the eucalypts and the manner with which the bond with the isocyanate resin is achieved. The swell was not dependent on the thickness of the sample and was insignificant for thicker cells.

In a 24 hour swell test, the value obtained for smaller samples of the same product was about 2 to 4% swell, which is significantly less than the swell test value of 12% specified by relevant standards.

In view of the submission of test results and the further comments hereinabove, Applicants request withdrawal of these rejections.

In view of the foregoing amendments and remarks, Applicants submit that the present application is now in condition for allowance. An early allowance of the application with amended claims is earnestly solicited.

Respectfully submitted,



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